GEL Laboratories LLC
a member of The GEL Group INC

PO Box 30712 Charleston, SC 29417
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gel.com

July 29, 2016

Mr. Scot Fitzgerald
CH2MHill Plateau Remediation Company
MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington 99352

Re: CHPRC SAF F16-043
Work Order: 401766
SDG: GEL401766

Dear Mr. Fitzgerald:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on July 16, 2016. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

Our policy is to provide high quality, personalized analytical services to enable you to meet your analytical needs on time every time. We trust that you will find everything in order and to your satisfaction. If you have any questions, please do not hesitate to call me at (843) 556-8171, ext. 4505.

Sincerely,

B Luthman

Brielle Luthman for
Heather Shaffer
Project Manager

Purchase Order: 304070 - 8C
Chain of Custody: F16-043-081, F16-043-082, F16-043-085 and F16-043-086
Enclosures

Table of Contents

Case Narrative

General Narrative
for
CH2MHill Plateau Remediation Company
CHPRC SAF F16-043
SDG: GEL401766

July 29, 2016

Laboratory Identification:

GEL Laboratories LLC
2040 Savage Road
Charleston, South Carolina 29407
(843) 556-8171

Summary

Sample receipt

The sample(s) arrived at GEL Laboratories, LLC, Charleston, South Carolina on July 16, 2016, for analysis. The samples were delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage. There are no additional comments concerning sample receipt.

Items of Note All efforts were made by the lab to meet any short hold times. Samples that were analyzed outside of the initial hold time but still within 2X hold time will be noted in the lab case narrative and DER.

Sample Identification
The laboratory received the following samples:

Laboratory Identification	Sample Description
401766001	B36644
401766002	B36649
401766003	B36648
401766004	B36645

Case Narrative

Sample analyses were conducted using methodology as outlined in GEL Laboratories, LLC (GEL) Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are contained in the analytical case narratives in the enclosed data package.

Data Package

The enclosed data package contains the following sections: General Narrative, Chain of Custody and Supporting Documentation, and data from the following fractions: GC/MS Volatile, General Chemistry, Metals and Radiochemistry.

We certify that this package is in compliance with the SOW, both technically and for completeness, including a full description of, explanation of, and corrective actions for, any and all deviations, from either the analyses requested or the case narrative requested. Release of the data contained in this hard copy data package has been authorized by the Laboratory Analytical Manager (or designee) and the laboratory's client services representative as verified by their signatures on this report.

B Luthman

Brielle Luthman for
Heather Shaffer
Project Manager

Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL401766
Work Order #: 401766

GC/MS Volatile

Volatile Organic Compounds (VOC) by Gas Chromatograph/Mass Spectrometer

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Quality Control (QC) Information

Surrogate Recoveries
Surrogate recoveries, in sample 401766003 (B36648) was outside the acceptance limits. Sample re-analysis confirmed matrix interference. The initial results are reported.

Technical Information

Sample Re-extraction/Re-analysis
Sample 401766003 (B36648) was re-analyzed due to unacceptable surrogate or internal standard recoveries in the initial analysis. The re-analysis confirmed. The initial results are reported.

Miscellaneous Information

Additional Comments
The samples in this SDG varied in color and size. Ten milliliters of de-ionized water was added to the contents of the sample container at the time of analysis.

Metals

Determination of Metals by ICP

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Calibration Information

CRDL/PQL Requirements
The PQL standard recoveries for SW846 6010C or 6010D met the control limits with the exception of potassium. Client sample concentrations were less than the MDL or greater than two times the PQL; therefore the data were not adversely affected. 401766002 (B36649) and 401766004 (B36645).

Quality Control (QC) Information

Duplicate Relative Percent Difference (RPD) Statement

Not all the applicable analyte RPD values were within the acceptance criteria.

Sample	Analyte	Value
1203586938 (B36649DUP)	Calcium	24.4* (0%-20%)
	Iron	105* (0%-20%)

Technical Information

Sample Dilutions
Samples were diluted for iron and titanium in order to bring raw values within the linear range of the instrument, and for the analytes interfered with, in order to ensure that the inter-element correction factors were valid for potassium, phosphorous, silver and antimony. Samples were diluted for phosphorus to ensure that the analyte concentrations were within the linear calibration range of the instrument. 401766002 (B36649) and 401766004 (B36645).

Analyte	401766	
	002	004
Antimony	20X	20X
Iron	10X	1X
Phosphorous	10X	10X
Potassium	10X	1X
Silver	20X	1X

Determination of Metals by ICP-MS

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Calibration Information

CRDL/PQL Requirements
The CRDL standard recoveries for SW846 6020A/6020B met the advisory control limits with the exception of molybdenum. Client sample concentrations were greater than two times the PQL; therefore the data were not adversely affected.

Quality Control (QC) Information

Method Blank (MB) Statement
The method blanks (MB) analyzed with this SDG met the exception criteria with the exception of zinc. In instances where there were positive hits in the method blank, the results were evaluated and appropriately flagged on the data. 1203587002 (MB).

Matrix Spike (MS/MSD) Recovery Statement
The MS/MSD (See Below) did not meet the recommended quality control acceptance criteria for percent recoveries for the following applicable analytes. The post spike recoveries were within the required control limits for some of the analytes. This verifies the absence of a matrix interference in the post-digested sample. For other

analytes the post spike failed verifying the presence of a matrix interference in the post-digested sample. The failing spike recoveries may be attributed to possible matrix interference and/or sample non-homogeneity.

Sample	Analyte	Value
1203587005 (B36649MS)	Chromium	29.3* (75%-125%)
	Selenium	74.2* (75%-125%)

Duplicate Relative Percent Difference (RPD) Statement
Not all the applicable analyte RPD values were within the acceptance criteria.

Sample	Analyte	Value
1203587004 (B36649DUP)	Aluminum	26.1* (0%-20%)
	Chromium	124* (0%-20%)
	Lead	580* (+/-378 ug/kg)
	Molybdenum	2659* (+/-189 ug/kg)
	Vanadium	31.3* (0%-20%)

Post Spike (PS) Recovery Statement
The PS did not meet the recommended quality control acceptance criteria for percent recoveries for all applicable analytes and verifies the presence of matrix interferences.

Sample	Analyte	Value
1203591115 (B36649PS)	Selenium	77.7* (80%-120%)

Technical Information

Sample Dilutions
Samples 401766002 (B36649) and 401766004 (B36645) were diluted to ensure that the analyte concentrations were within the linear calibration range of the instrument. The ICPMS solid samples in this SDG were diluted the standard two times.

Analyte	401766	
	002	004
Several	2X 10X	2X 10X

General Chemistry

Carbon, Total Organic

There are no exceptions, anomalies or deviations from the specified methods. All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration,

continuing calibration, instrument controls and process controls where applicable.

pH

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Technical Information

Holding Times
Samples (See Below) were received by the laboratory outside of the method specified holding time. The data is qualified.

Sample	Analyte	Value
1203586456 (B36649DUP)	pH	Received 16-JUL-16, out of holding 14-JUL-16
401766002 (B36649)	pH	Received 16-JUL-16, out of holding 14-JUL-16
401766004 (B36645)	pH	Received 16-JUL-16, out of holding 14-JUL-16

Radiochemistry

Dry Weight

There are no exceptions, anomalies or deviations from the specified methods. All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable.

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

Chain of Custody and Supporting Documentation

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F16-043-081	PAGE 1 OF 1
COLLECTOR D Wright chpec	**COMPANY CONTACT** TODAK, D	**TELEPHONE NO.** 376-6427	**PROJECT COORDINATOR** TODAK, D	**PRICE CODE** 8C	**DATA TURNAROUND**
SAMPLING LOCATION C9425, I-001	**PROJECT DESIGNATION** 100-NR-2 Drilling - Soil		**SAF NO.** F16-043	**AIR QUALITY** ☐	15 Days / 15 Days
ICE CHEST NO. GWS-406	**FIELD LOGBOOK NO.** HNF-N-645 3 - 8C	**ACTUAL SAMPLE DEPTH** 39.75 to 41.92 FT	**COA** 304070	**METHOD OF SHIPMENT** FEDERAL EXPRESS	**ORIGINAL**
SHIPPED TO GEL Laboratories, LLC	**OFFSITE PROPERTY NO.** 6830		**BILL OF LADING/AIR BILL NO.** 7767 6712 5639		

MATRIX*
A=Air
DL=Drum Liquids
DS=Drum Solids
L=Liquid
O=Oil
S=Soil
SE=Sediment
T=Tissue
V=Vegetation
W=Water
WI=Wipe
X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS
*Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

SPECIAL HANDLING AND/OR STORAGE N/A

PRESERVATION	Cool <-7C and >-20C
HOLDING TIME	14 Days
TYPE OF CONTAINER	aGs
NO. OF CONTAINER(S)	5
VOLUME	40mL
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B36644	SOIL	JUL 14 2016	1415	✓

461766

August 1, 2016

CHAIN OF POSSESSION

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
D Wright chpec	JUL 14 2016 1600	SSU-1	JUL 14 2016 1600
SSU-1	JUL 15 2016 0830	Lesley Wall /CHPRC	JUL 15 2016 0830
Lesley Wall /CHPRC	JUL 15 2016 1400	FEDEX	
FX		M. Gaslow	7-16-16 0910

SPECIAL INSTRUCTIONS
SPLIT SPOON PARTS B & A WILL BE COMBINED TO ENSURE ADEQUATE SAMPLE MATERIAL FOR ANALYSIS; ** All VOA samples will be collected using EPA Method 5035A and will include 5 bottles for low level analysis.** The laboratory is to use one of the low level VOA bottles for moisture content determination.** VOA bottles will be labeled with an appended suffix of K, L, M, N, or P. These suffixes are for the purpose of providing bottle weights to the laboratories. These suffixes should not be included as part of the sample ID reported in the final data packages.
(1) 5035/8260_VOA: LOW LEVEL: COMMON {Chloroform, Ethylbenzene};

LABORATORY SECTION	**RECEIVED BY**	**TITLE**	**DATE/TIME**
FINAL SAMPLE DISPOSITION	**DISPOSAL METHOD**	**DISPOSED BY**	**DATE/TIME**

PRINTED ON 7/12/2016 **FSR ID = FSR33899** **TRVL NUM = TRVL-16-186** A-6003-618 (REV 2)

SAMPLE RECORD SHEET FOR VOC SAMPLE COLLECTION

Location: C9425 - I-001 100-N

Sampler Initials and Date: EAK 7-14-16

Sample Number [1]	Sample Suffix	Initial Weight [2] (grams)	Total Weight [3] (grams)	Soil Weight [4] (grams)
B36644	K	29.5	36.4	6.9
↑	L	29.2	38.3	9.1
	M	29.3	36.1	6.8
↓	N	29.3	35.7	6.4
B36644	P	29.2	37.9	8.7

[1] Enter sample number associated with the sampling event.

[2] Initial weight is to include all labels, stickers, bags, spin bars (for samples with suffix K, L, M, N and P) and anything else that will be associated with the bottle when it is weighed with the sample.

[3] Ensure that everything weighed for the empty bottle and no additional items (besides the sample) is weighed.

[4] Soil weight is the vial with sample minus Initial Weight.

A-6005-526 (REV 0)

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F16-043-086	PAGE 1 OF 1
COLLECTOR D Wright	**COMPANY CONTACT** TODAK, D	**TELEPHONE NO.** 376-6427	**PROJECT COORDINATOR** TODAK, D	**PRICE CODE** 8C	**DATA TURNAROUND**
SAMPLING LOCATION C9425, I-001 DUP	**PROJECT DESIGNATION** 100-NR-2 Drilling - Soil		**SAF NO.** F16-043	**AIR QUALITY** ☐	15 Days / 15 Days
ICE CHEST NO. GWS-406	**FIELD LOGBOOK NO.** HNF-N-645 3 . 96	**ACTUAL SAMPLE DEPTH** 39.75 to 41.92 FT	**COA** 304070	**METHOD OF SHIPMENT** FEDERAL EXPRESS	**ORIGINAL**
SHIPPED TO GEL Laboratories, LLC	**OFFSITE PROPERTY NO.** 6830		**BILL OF LADING/AIR BILL NO.** 7767 6712 5639		

MATRIX*
A=Air
DL=Drum Liquids
DS=Drum Solids
L=Liquid
O=Oil
S=Soil
SE=Sediment
T=Tissue
V=Vegetation
W=Water
WI=Wipe
X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS
*Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

SPECIAL HANDLING AND/OR STORAGE N/A

PRESERVATION	None	Cool <=6C	None	None
HOLDING TIME	6 Months	28 Days	ASAP	None
TYPE OF CONTAINER	G/P	aG	G/P	Moisture Resistant Cont.
NO. OF CONTAINER(S)	1	1	1	1
VOLUME	250mL	250mL	60mL	200g
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	9060_TOC: COMMON;	9045_pH (Non-Aqueous): COMMON;	SEE ITEM (2) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME				
B36649	SOIL	JUL 14 2016	1415	✓	✓	✓	✓

CHAIN OF POSSESSION

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
D Wright (change)	JUL 14 2016 1600	SSU-1	JUL 14 2016 1600
SSU-1	JUL 15 2016 0830	Lesly Wall (CHPRC)	JUL 15 2016 0830
Lesly Wall (CHPRC)	JUL 15 2016 1400	FEDEX	
	1700	M Kinslow	7-16-16 0910

SIGN/ PRINT NAMES

SPECIAL INSTRUCTIONS
(1) 6020_METALS_ICPMS: COMMON {Aluminum, Barium, Cadmium, Chromium, Cobalt, Copper, Lead, Molybdenum, Selenium}; 6020_METALS_ICPMS: COMMON (Add-on) {Antimony, Arsenic, Manganese, Nickel, Silver, Strontium, Vanadium, Zinc}; 6010_METALS_ICP: COMMON {Calcium, Iron, Magnesium, Potassium, Sodium}; 6010_METALS_ICP: COMMON (Add-on) {Phosphorus};
(2) Moisture Content - D2216 {Percent moisture (wet sample)};

LABORATORY SECTION	**RECEIVED BY**	**TITLE**	**DATE/TIME**
FINAL SAMPLE DISPOSITION	**DISPOSAL METHOD**	**DISPOSED BY**	**DATE/TIME**

PRINTED ON 7/11/2016 FSR ID = FSR33900 TRVL NUM = TRVL-16-186 A-6003-618 (REV 2)

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F16-043-085	PAGE 1 OF 1
COLLECTOR D wight	**COMPANY CONTACT** TODAK, D	**TELEPHONE NO.** 376-6427	**PROJECT COORDINATOR** TODAK, D	**PRICE CODE** 8C	**DATA TURNAROUND**
SAMPLING LOCATION C9425, I-001 DUP	**PROJECT DESIGNATION** 100-NR-2 Drilling - Soil		**SAF NO.** F16-043	**AIR QUALITY** ☐	15 Days / 15 Days
ICE CHEST NO. GWS-406	**FIELD LOGBOOK NO.** HNF-N-645 3 - 84	**ACTUAL SAMPLE DEPTH** 39.75 to 41.92 ft	**COA** 304070	**METHOD OF SHIPMENT** FEDERAL EXPRESS	**ORIGINAL**
SHIPPED TO GEL Laboratories, LLC	**OFFSITE PROPERTY NO.** 6830		**BILL OF LADING/AIR BILL NO.** 7767 6712 5639		

MATRIX*
A=Air
DL=Drum Liquids
DS=Drum Solids
L=Liquid
O=Oil
S=Soil
SE=Sediment
T=Tissue
V=Vegetation
W=Water
WI=Wipe
X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS
*Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

SPECIAL HANDLING AND/OR STORAGE N/A

PRESERVATION	Cool <-7C and >-20C
HOLDING TIME	14 Days
TYPE OF CONTAINER	aGs
NO. OF CONTAINER(S)	5
VOLUME	40mL
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B36648	SOIL	JUL 14 2016	1415	✓

August 1, 2016

CHAIN OF POSSESSION

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
D wight	JUL 14 2016 1600	SSU-1	JUL 14 2016 1600
SSU-1	JUL 15 2016 0830	Lesly Wall ICHPRC	JUL 15 2016 0830
Lesly Wall ICHPRC	JUL 15 2016 1400	FEDEX	
FX		M. Knutson	7-16-16 0910

SIGN/ PRINT NAMES

SPECIAL INSTRUCTIONS
** All VOA samples will be collected using EPA Method 5035A and will include 5 bottles for low level analysis.** The laboratory is to use one of the low level VOA bottles for moisture content determination.** VOA bottles will be labeled with an appended suffix of K, L, M, N, or P. These suffixes are for the purpose of providing bottle weights to the laboratories. These suffixes should not be included as part of the sample ID reported in the final data packages.
(1) 5035/8260_VOA: LOW LEVEL: COMMON {Chloroform, Ethylbenzene};

LABORATORY SECTION	**RECEIVED BY**		**TITLE**	**DATE/TIME**
FINAL SAMPLE DISPOSITION	**DISPOSAL METHOD**		**DISPOSED BY**	**DATE/TIME**

PRINTED ON 7/11/2016 **FSR ID = FSR33900** **TRVL NUM = TRVL-16-186** A-6003-618 (REV 2)

SAMPLE RECORD SHEET FOR VOC SAMPLE COLLECTION

Location: C9425 I-001 Dup 100.N

Sampler Initials and Date: ELK 7-14-16

Sample Number [1]	Sample Suffix	Initial Weight [2] (grams)	Total Weight [3] (grams)	Soil Weight [4] (grams)
B36648	K	29.3	36.4	7.1
↑	L	29.3	35.8	6.5
	M	29.2	36.6	7.4
↓	N	29.3	36.8	7.6
B36648	P	29.2	37.2	8

[1] Enter sample number associated with the sampling event.

[2] Initial weight is to include all labels, stickers, bags, spin bars (for samples with suffix K, L, M, N and P) and anything else that will be associated with the bottle when it is weighed with the sample.

[3] Ensure that everything weighed for the empty bottle and no additional items (besides the sample) is weighed.

[4] Soil weight is the vial with sample minus Initial Weight.

A-6005-526 (REV 0)

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST 861bs		F16-043-082	PAGE 1 OF 1
COLLECTOR: D. Wright chprc	COMPANY CONTACT: TODAK, D	TELEPHONE NO.: 376-6427	PROJECT COORDINATOR: TODAK, D	PRICE CODE: 8C; DATA TURNAROUND: 15 Days / 15 Days; AIR QUALITY: ☐
SAMPLING LOCATION: C9425, I-001	PROJECT DESIGNATION: 100-NR-2 Drilling - Soil		SAF NO.: F16-043	
ICE CHEST NO.: GWS-406	FIELD LOGBOOK NO.: HNF-N-645 7 - 96	ACTUAL SAMPLE DEPTH: 39.75 to 41.92 ft	COA: 304070	METHOD OF SHIPMENT: FEDERAL EXPRESS; ORIGINAL
SHIPPED TO: GEL Laboratories, LLC	OFFSITE PROPERTY NO.: 6830		BILL OF LADING/AIR BILL NO.: 7767 6712 5639	

MATRIX*: A=Air, DL=Drum Liquids, DS=Drum Solids, L=Liquid, O=Oil, S=Soil, SE=Sediment, T=Tissue, V=Vegetation, W=Water, WI=Wipe, X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS
*Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

SPECIAL HANDLING AND/OR STORAGE
N/A

PRESERVATION	None	Cool <=6C	None	None
HOLDING TIME	6 Months	28 Days	ASAP	None
TYPE OF CONTAINER	G/P	aG	G/P	Moisture Resistant Cont.
NO. OF CONTAINER(S)	1	1	1	1
VOLUME	250mL	250mL	60mL	200g
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	9060_TOC: COMMON;	9045_pH (Non-Aqueous): COMMON;	SEE ITEM (2) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME				
B36645	SOIL	JUL 14 2016	1415	✓	✓	✓	✓

CHAIN OF POSSESSION

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
D. Wright chprc	JUL 14 2016 1600	SSU-1	JUL 14 2016 1600
SSU-1	JUL 15 2016 0830	Lesly Wall /CHPRC	JUL 15 2016 0830
Lesly Wall /CHPRC	JUL 15 2016 1400	FEDEX	
		M. Knudson	7-16-16 0900

SPECIAL INSTRUCTIONS
SPLIT SPOON PARTS B & A WILL BE COMBINED TO ENSURE ADEQUATE SAMPLE MATERIAL FOR ANALYSIS;
(1) 6020_METALS_ICPMS: COMMON {Aluminum, Barium, Cadmium, Chromium, Cobalt, Copper, Lead, Molybdenum, Selenium}; 6020_METALS_ICPMS: COMMON (Add-on) {Antimony, Arsenic, Manganese, Nickel, Silver, Strontium, Vanadium, Zinc}; 6010_METALS_ICP: COMMON {Calcium, Iron, Magnesium, Potassium, Sodium}; 6010_METALS_ICP: COMMON (Add-on) {Phosphorus};
(2) Moisture Content - D2216 {Percent moisture (wet sample)};

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

PRINTED ON 7/12/2016 FSR ID = FSR33899 TRVL NUM = TRVL-16-186 A-6003-618 (REV 2)

GEL Laboratories LLC

SAMPLE RECEIPT & REVIEW FORM

Client: CHPA	SDG/AR/COC/Work Order: 401766
Received By: MC	Date Received: 7-16-16

Suspected Hazard Information	Yes	No	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.
COC/Samples marked as radioactive?		✓	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): Cpm 0
Classified Radioactive II or III by RSO?		✓	If yes, Were swipes taken of sample containers < action levels?
COC/Samples marked containing PCBs?		✓	
Package, COC, and/or Samples marked as beryllium or asbestos containing?		✓	If yes, samples are to be segregated as Safety Controlled Samples, and opened by the GEL Safety Group.
Shipped as a DOT Hazardous?		✓	Hazard Class Shipped: UN#:
Samples identified as Foreign Soil?		✓	

	Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1	Shipping containers received intact and sealed?	✓			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2	Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	✓			Preservation Method: Ice bags Blue ice Dry ice None Other (describe) *all temperatures are recorded in Celsius 1C 2C
2a	Daily check performed and passed on IR temperature gun?	✓			Temperature Device Serial #: 130961961 Secondary Temperature Device Serial # (If Applicable):
3	Chain of custody documents included with shipment?	✓			
4	Sample containers intact and sealed?	✓			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
5	Samples requiring chemical preservation at proper pH?			✓	Sample ID's, containers affected and observed pH: If Preservation added, Lot#:
6	Do Low Level Perchlorate samples have headspace as required?			✓	Sample ID's and containers affected:
7	VOA vials contain acid preservation?			✓	(If unknown, select No)
8	VOA vials free of headspace (defined as < 6mm bubble)?			✓	Sample ID's and containers affected:
9	Are Encore containers present?			✓	(If yes, immediately deliver to Volatiles laboratory)
10	Samples received within holding time?	✓			ID's and tests affected:
11	Sample ID's on COC match ID's on bottles?	✓			Sample ID's and containers affected:
12	Date & time on COC match date & time on bottles?	✓			Sample ID's affected:
13	Number of containers received match number indicated on COC?	✓			Sample ID's affected:
14	Are sample containers identifiable as GEL provided?			✓	
15	COC form is properly signed in relinquished/received sections?	✓			
16	Carrier and tracking number.				Circle Applicable: FedEx Air FedEx Ground UPS Field Services Courier Other 7767 6712 5639 1C 5444 20C NO ice 4687 2C 5308 2C 5098 21C NO ice 5250 2C

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials EM Date 7/16/16 Page 1 of 1

GL-CHL-SR-001 Rev 3

Data Review Qualifier Definitions

GEL LABORATORIES LLC
2040 Savage Road Charleston, SC 29407 (843) 556−8171

Report Date: 29−JUL−16

Project Specific Qualifier Definitions for GEL Client Code: CPRC

Qualifier	Qualifier Definition	Department	Fraction
U	Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.		
J	The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).Value is estimated	Organics	
P	Aroclor target analyte with greater than 25% difference between column analyses.	Organics	
C	Analyte has been confirmed by GC/MS analysis	Organics	Pesticide
B	The analyte was detected in both the associated QC blank and in the sample.	Organics	
E	Concentration exceeds the calibration range of the instrument	Organics	
A	The TIC is a suspected aldol−condensation product	Organics	Semi−Volatile
X	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier		
N	Spike Sample recovery is outside control limits.		
*	Duplicate analysis not within control limits	Inorganics	
>	Result greater than quantifiable range or greater than upper limit of the analysis range	General Chemistry	
Z	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier		
B	The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).	Inorganics	Metals
D	Results are reported from a diluted aliquot of sample.		
E	Reported value is estimated due to interferences. See comment in narrative.	Inorganics	Metals
M	Duplicate precision not met.	Inorganics	Metals
o	Analyte failed to recover within LCS limits (0rganics only)	Organics	
S	Reported value determined by the Method of Standard Additions (MSA)	Inorganics	
T	Spike and/or spike duplicate sample recovery is outside control limits.	Organics	
W	Post−digestion spike recovery for GFAA out of control limit. Sample absorbency < 50% of spike absorbency.	Inorganics	
B	The associated QC sample blank has a result >= 2X the MDA and, after corrections, result is >= MDA for this sample	Radiological	
Y	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier		
+	Correlation coefficient for Method of Standard Additions (MSA) is < 0.995	Inorganics	
B	The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).	General Chemistry	
C	Target analyte was detected in the sample and the associated blank. The associated blank concentration is >= EQL or is > 5% of the measured concentration and/or decision level for associated samples.	Inorganics	Metals
C	Target analyte was detected in the sample and the associated blank. The associated blank concentration is >= EQL or is > 5% of the measured concentration and/or decision level for associated samples.	General Chemistry	
<	Sample is below the EPA guidance level for Reactive Releasable Cyanide and/or Reactive Releasable Sulfide	General Chemistry	
UX	Gamma Spectroscopy−−Uncertain identification	Radiological	

Laboratory Certifications

List of current GEL Certifications as of 29 July 2016

State	Certification
Alaska	UST−0110
Arkansas	88−0651
CLIA	42D0904046
California	2940
Colorado	SC00012
Connecticut	PH−0169
Delaware	SC00012
DoD ELAP/ ISO17025 A2LA	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330−15−00283, P330−15−00253
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC00012
Idaho Chemistry	SC00012
Idaho Radiochemistry	SC00012
Illinois NELAP	200029
Indiana	C−SC−01
Kansas NELAP	E−10332
Kentucky SDWA	90129
Kentucky Wastewater	90129
Louisiana NELAP	03046 (AI33904)
Louisiana SDWA	LA160006
Maryland	270
Massachusetts	M−SC012
Michigan	9976
Mississippi	SC00012
Nebraska	NE−OS−26−13
Nevada	SC000122016−1
New Hampshire NELAP	205415
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
North Dakota	R−158
Oklahoma	9904
Pennsylvania NELAP	68−00485
S.Carolina Radchem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235−16−11
Utah NELAP	SC000122016−20
Vermont	VT87156
Virginia NELAP	460202
Washington	C780
West Virginia	997404

Volatile Analysis

Case Narrative

GC/MS Volatile
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL401766
Work Order #: 401766

Product: **Volatile Organic Compounds (VOC) by Gas Chromatograph/Mass Spectrometer**
Analytical Method: SW846 5035A/8260C
Analytical Procedure: GL-OA-E-038 REV# 22
Analytical Batch: 1584772

Preparation Method: SW846 5035A
Preparation Procedure: GL-OA-E-039 REV# 10
Preparation Batch: 1584771

The following samples were analyzed using the above methods and analytical procedure(s).

GEL Sample ID#	Client Sample Identification
401766001	B36644
401766003	B36648
1203592396	Method Blank (MB)
1203592398	Laboratory Control Sample (LCS)
1203592399	401766001(B36644) Post Spike (PS)
1203592400	401766001(B36644) Post Spike Duplicate (PSD)

The samples in this SDG were analyzed on a "dry weight" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Quality Control (QC) Information

Surrogate Recoveries
Surrogate recoveries, in sample 401766003 (B36648) was outside the acceptance limits. Sample re-analysis confirmed matrix interference. The initial results are reported.

Technical Information

Sample Re-extraction/Re-analysis
Sample 401766003 (B36648) was re-analyzed due to unacceptable surrogate or internal standard recoveries in the initial analysis. The re-analysis confirmed. The initial results are reported.

Miscellaneous Information

Additional Comments
The samples in this SDG varied in color and size. Ten milliliters of de-ionized water was added to the contents of the sample container at the time of analysis.

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the

requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

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Qualifier Definition Report
for

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL401766 GEL Work Order: 401766

The Qualifiers in this report are defined as follows:

T Spike and/or spike duplicate sample recovery is outside control limits.

U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.

DL Indicates that sample is diluted.

RA Indicates that sample is re-analyzed without re-extraction.

RE Indicates that sample is re-extracted.

Review/Validation

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

Signature: Erin Haubert **Name: Erin Haubert**

Date: 28 JUL 2016 **Title: Data Validator**

Sample Data Summary

Volatile
Certificate of Analysis
Sample Summary

SDG Number:	**GEL401766**	**Date Collected:**	**07/14/2016 14:15**	**Matrix:**	**SOIL**
Lab Sample ID:	**401766001**	**Date Received:**	**07/16/2016 09:10**	**%Moisture:**	**3.8**
		Client:	**CPRC001**	**Project:**	**CPRC0F16043**
Client ID:	**B36644**	**Method:**	**SW846 5035A/8260C**	**SOP Ref:**	**GL-OA-E-038**
Batch ID:	**1584772**	**Inst:**	**VOA3.I**	**Dilution:**	**1**
Run Date:	**07/26/2016 10:55**	**Analyst:**	**CDS1**	**Purge Vol:**	**5 mL**
Prep Date:	**07/14/2016 14:15**	**Aliquot:**	**6.4 g**	**Final Volume:**	**5 mL**
Data File:	**072616V3\3T208.D**	**Column:**	**DB-624**		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
67-66-3	Chloroform	U	0.244	ug/kg	0.244	1.62
100-41-4	Ethylbenzene	U	0.244	ug/kg	0.244	1.62

Volatile
Certificate of Analysis
Sample Summary

SDG Number:	**GEL401766**	**Date Collected:**	**07/14/2016 14:15**	**Matrix:**	**SOIL**
Lab Sample ID:	**401766003**	**Date Received:**	**07/16/2016 09:10**	**%Moisture:**	**4.6**
		Client:	**CPRC001**	**Project:**	**CPRC0F16043**
Client ID:	**B36648**	**Method:**	**SW846 5035A/8260C**	**SOP Ref:**	**GL-OA-E-038**
Batch ID:	**1584772**	**Inst:**	**VOA3.I**	**Dilution:**	**1**
Run Date:	**07/26/2016 11:26**	**Analyst:**	**CDS1**	**Purge Vol:**	**5 mL**
Prep Date:	**07/14/2016 14:15**	**Aliquot:**	**7.6 g**	**Final Volume:**	**5 mL**
Data File:	**072616V3\3T209.D**	**Column:**	**DB-624**		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
67-66-3	Chloroform	U	0.207	ug/kg	0.207	1.38
100-41-4	Ethylbenzene	U	0.207	ug/kg	0.207	1.38

Quality Control Summary

GEL LABORATORIES LLC
2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

QC Summary

Report Date: July 27, 2016

CH2MHill Plateau Remediation Company
MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington

Contact: **Mr. Scot Fitzgerald**

Workorder: **401766**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Volatile-GC/MS										
Batch 1584772										
QC1203592398 LCS										
Chloroform	50.0			56.2	ug/kg		112	(70%-130%)	CDS1	07/26/16 08:53
Ethylbenzene	50.0			55.5	ug/kg		111	(70%-130%)		
**1,2-Dichloroethane-d4	50.0			49.7	ug/L		99	(81%-124%)		
**Bromofluorobenzene	50.0			52.1	ug/L		104	(70%-130%)		
**Toluene-d8	50.0			49.3	ug/L		99	(81%-120%)		
QC1203592396 MB										
Chloroform			U	0.300	ug/kg					07/26/16 10:24
Ethylbenzene			U	0.300	ug/kg					
**1,2-Dichloroethane-d4	50.0			52.4	ug/L		105	(81%-124%)		
**Bromofluorobenzene	50.0			50.9	ug/L		102	(70%-130%)		
**Toluene-d8	50.0			51.3	ug/L		103	(81%-120%)		
QC1203592399 401766001 PS										
Chloroform	50.0	U	0.00	46.9	ug/L		94	(70%-130%)		07/26/16 15:31
Ethylbenzene	50.0	U	0.00	43.3	ug/L		87	(70%-130%)		
**1,2-Dichloroethane-d4	50.0		61.0	50.3	ug/L		101	(81%-124%)		
**Bromofluorobenzene	50.0		55.2	51.9	ug/L		104	(70%-130%)		
**Toluene-d8	50.0		56.8	48.4	ug/L		97	(81%-120%)		
QC1203592400 401766001 PSD										
Chloroform	50.0	U	0.00	46.3	ug/L	1	93	(0%-20%)		07/26/16 16:02
Ethylbenzene	50.0	U	0.00	40.2	ug/L	7	80	(0%-20%)		
**1,2-Dichloroethane-d4	50.0		61.0	51.2	ug/L		102	(81%-124%)		

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QC Summary

Workorder: **401766**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Volatile-GC/MS										
Batch 1584772										
**Bromofluorobenzene	50.0	55.2		53.0	ug/L		106	(70%-130%)		
**Toluene-d8	50.0	56.8		48.1	ug/L		96	(81%-120%)	CDS1	07/26/16 16:02

Notes:

The Qualifiers in this report are defined as follows:

- A The TIC is a suspected aldol-condensation product
- B The analyte was detected in both the associated QC blank and in the sample.
- C Analyte has been confirmed by GC/MS analysis
- D Results are reported from a diluted aliquot of sample.
- E Concentration exceeds the calibration range of the instrument
- J The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).Value is estimated
- N Spike Sample recovery is outside control limits.
- P Aroclor target analyte with greater than 25% difference between column analyses.
- T Spike and/or spike duplicate sample recovery is outside control limits.
- U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Y Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Z Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- o Analyte failed to recover within LCS limits (0rganics only)

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.
^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.
* Indicates that a Quality Control parameter was not within specifications.
For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.

Volatile

Surrogate Recovery Report

SDG Number: GEL401766

Matrix Type: SOLID

Sample ID	Client ID	DCED4 %REC	TOL %REC	BFB %REC
1203592398	LCS for batch 1584771	99	99	104
1203592396	MB for batch 1584771	105	103	102
401766001	B36644	122	114	110
401766003	B36648	142 *	132 *	131 *
1203592399	B36644PS	101	97	104
1203592400	B36644PSD	102	96	106

Surrogate		Acceptance Limits
DCED4	= 1,2-Dichloroethane-d4	(81%-124%)
TOL	= Toluene-d8	(81%-120%)
BFB	= Bromofluorobenzene	(70%-130%)

* Recovery outside Acceptance Limits
# Column to be used to flag recovery values
D Sample Diluted

Metals Analysis

Case Narrative

Metals
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL401766
Work Order #: 401766

Product: **Determination of Metals by ICP**
Analytical Method: 6010_METALS_ICP
Analytical Procedure: GL-MA-E-013 REV# 26
Analytical Batch: 1582558

Product: **Determination of Metals by ICP-MS**
Analytical Method: 6020_METALS_ICPMS
Analytical Procedure: GL-MA-E-014 REV# 28
Analytical Batch: 1582595

Preparation Method: SW846 3050B
Preparation Procedure: GL-MA-E-009 REV# 26
Preparation Batches: 1582557 and 1582593

The following samples were analyzed using the above methods and analytical procedure(s).

GEL Sample ID#	Client Sample Identification
401766002	B36649
401766004	B36645
1203586936	Method Blank (MB)**ICP**
1203586937	Laboratory Control Sample (LCS)
1203586940	401766002(B36649L) Serial Dilution (SD)
1203586938	401766002(B36649D) Sample Duplicate (DUP)
1203586939	401766002(B36649S) Matrix Spike (MS)
1203587002	Method Blank (MB)**ICP-MS**
1203587003	Laboratory Control Sample (LCS)
1203587006	401766002(B36649L) Serial Dilution (SD)
1203587004	401766002(B36649D) Sample Duplicate (DUP)
1203587005	401766002(B36649S) Matrix Spike (MS)
1203591115	401766002(B36649PS) Post Spike (PS)

The samples in this SDG were analyzed on a "dry weight" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Calibration Information

CRDL/PQL Requirements
The PQL standard recoveries for SW846 6010C or 6010D met the control limits with the exception of potassium. Client sample concentrations were less than the MDL or greater than two times the PQL; therefore the data were not adversely affected. 401766002 (B36649) and 401766004 (B36645)-ICP. The CRDL standard recoveries for SW846 6020A/6020B met the advisory control limits with the exception of molybdenum. Client

sample concentrations were greater than two times the PQL; therefore the data were not adversely affected. ICP-MS.

Quality Control (QC) Information

Method Blank (MB) Statement

The method blanks (MB) analyzed with this SDG met the exception criteria with the exception of zinc. In instances where there were positive hits in the method blank, the results were evaluated and appropriately flagged on the data. 1203587002 (MB)-ICP-MS.

Matrix Spike (MS/MSD) Recovery Statement

The percent recoveries (%R) obtained from the MS/MSD analyses are evaluated when the sample concentration is less than four times (4X) the spike concentration added. The MS/MSD (See Below) did not meet the recommended quality control acceptance criteria for percent recoveries for the following applicable analytes. The post spike recoveries were within the required control limits for some of the analytes. This verifies the absence of a matrix interference in the post-digested sample. For other analytes the post spike failed verifying the presence of a matrix interference in the post-digested sample. The failing spike recoveries may be attributed to possible matrix interference and/or sample non-homogeneity.

Sample	Analyte	Value
1203587005 (B36649MS)	Chromium	29.3* (75%-125%)
	Selenium	74.2* (75%-125%)

Duplicate Relative Percent Difference (RPD) Statement

The RPD obtained from the designated sample duplicate (DUP) is evaluated based on acceptance criteria of 20% when the sample is >5X the contract required reporting limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control of +/-RL is used to evaluate the DUP results. Not all the applicable analyte RPD values were within the acceptance criteria.

Sample	Analyte	Value
1203586938 (B36649DUP)	Calcium	24.4* (0%-20%)
	Iron	105* (0%-20%)
1203587004 (B36649DUP)	Aluminum	26.1* (0%-20%)
	Chromium	124* (0%-20%)
	Lead	580* (+/-378 ug/kg)
	Molybdenum	2659* (+/-189 ug/kg)
	Vanadium	31.3* (0%-20%)

Post Spike (PS) Recovery Statement

The percent recoveries (%R) obtained from the PS analyses are evaluated when the sample concentration is less than four times (4X) the spike concentration added. The PS did not meet the recommended quality control acceptance criteria for percent recoveries for all applicable analytes and verifies the presence of matrix interferences.

Sample	Analyte	Value
1203591115 (B36649PS)	Selenium	77.7* (80%-120%)

Technical Information

Preparation/Analytical Method Verification
Method SW-846 3050B is not a total digestion technique for most samples. It is a very strong acid digestion that will dissolve almost all elements that could become environmentally available. By design, elements bound in silicate structures are not normally dissolved by this procedure as they are not usually mobile in the environment.

Sample Dilutions
Dilutions are performed to minimize matrix interferences resulting from elevated mineral element concentrations present in solid samples and/or to bring over range target analyte concentrations into the linear calibration range of the instrument. Samples were diluted for iron and titanium in order to bring raw values within the linear range of the instrument, and for the analytes interfered with, in order to ensure that the inter-element correction factors were valid for potassium, phosphorous, silver and antimony. Samples were diluted for phosphorus to ensure that the analyte concentrations were within the linear calibration range of the instrument. 401766002 (B36649) and 401766004 (B36645)-ICP. Samples 401766002 (B36649) and 401766004 (B36645)-ICP-MS were diluted to ensure that the analyte concentrations were within the linear calibration range of the instrument. The ICPMS solid samples in this SDG were diluted the standard two times. ICP-MS.

Analyte	401766	
	002	004
Several	20X 2X 10X 1X	20X 2X 10X 1X

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

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Qualifier Definition Report
for

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL401766 GEL Work Order: 401766

The Qualifiers in this report are defined as follows:

* Duplicate analysis not within control limits

B The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).

D Results are reported from a diluted aliquot of sample.

N Spike Sample recovery is outside control limits.

U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.

Review/Validation

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

Signature:  **Name: Nik-Cole Elmore**

Date: 29 JUL 2016 **Title: Data Validator**

Sample Data Summary

GEL Laboratories LLC

METALS
−1−
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL401766 **CONTRACT:** CPRC0F16043 **METHOD TYPE:** SW846

SAMPLE ID: 401766002 **BASIS:** Dry Weight **DATE COLLECTED** 14−JUL−16

CLIENT ID: B36649 **LEVEL:** Low **DATE RECEIVED** 16−JUL−16

MATRIX: SOIL **%SOLIDS:** 97.6

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429−90−5	Aluminum	8350000	ug/kg	D*	15300	50800	50	10	MS	SKJ	07/25/16 21:30	160725−6	1582595
7440−36−0	Antimony	6660	ug/kg	UD	6660	20200	20200	20	P	HSC	07/28/16 08:57	072816A−2	1582558
7440−38−2	Arsenic	605	ug/kg	BD	203	1020	10	2	MS	SKJ	07/22/16 19:21	160722−5	1582595
7440−39−3	Barium	77700	ug/kg	D	508	2030	20	10	MS	SKJ	07/25/16 21:30	160725−6	1582595
7440−43−9	Cadmium	396	ug/kg	D	20.3	203	5	2	MS	SKJ	07/22/16 19:21	160722−5	1582595
7440−70−2	Calcium	8100000	ug/kg	*	8070	25200	25200	1	P	HSC	07/29/16 09:15	072916−3	1582558
7440−47−3	Chromium	15100	ug/kg	D*N	203	610	10	2	MS	SKJ	07/22/16 19:21	160722−5	1582595
7440−48−4	Cobalt	11500	ug/kg	D	61	203	20	2	MS	SKJ	07/22/16 19:21	160722−5	1582595
7440−50−8	Copper	26500	ug/kg	D	336	1020	8	10	MS	SKJ	07/25/16 21:30	160725−6	1582595
7439−89−6	Iron	108000000	ug/kg	D*	80700	252000	252000	10	P	HSC	07/29/16 09:18	072916−3	1582558
7439−92−1	Lead	1930	ug/kg	D*	102	407	15	2	MS	SKJ	07/22/16 19:21	160722−5	1582595
7439−95−4	Magnesium	5030000	ug/kg		8570	30300	30300	1	P	HSC	07/29/16 09:15	072916−3	1582558
7439−96−5	Manganese	352000	ug/kg	D	1020	5080	5	10	MS	SKJ	07/26/16 11:50	160726−7	1582595
7439−98−7	Molybdenum	3440	ug/kg	D*	61	203	20	2	MS	SKJ	07/22/16 19:21	160722−5	1582595
7440−02−0	Nickel	8500	ug/kg	D	102	407	40	2	MS	SKJ	07/22/16 19:21	160722−5	1582595
7723−14−0	Phosphorous	1580000	ug/kg	D	50400	151000	151000	10	P	HSC	07/29/16 09:18	072916−3	1582558
7440−09−7	Potassium	926000	ug/kg	D	64600	252000	252000	10	P	HSC	07/29/16 09:18	072916−3	1582558
7782−49−2	Selenium	336	ug/kg	UDN	336	1020	50	2	MS	SKJ	07/25/16 22:01	160725−6	1582595
7440−22−4	Silver	3000	ug/kg	BD	2020	10100	10100	20	P	HSC	07/28/16 08:57	072816A−2	1582558
7440−23−5	Sodium	3820000	ug/kg		7060	25200	25200	1	P	HSC	07/29/16 09:15	072916−3	1582558
7440−24−6	Strontium	32700	ug/kg	D	2030	10200	10	10	MS	SKJ	07/25/16 21:30	160725−6	1582595
7440−62−2	Vanadium	62100	ug/kg	D*	305	1020	1020	2	MS	BAJ	07/27/16 23:05	160727−4	1582595
7440−66−6	Zinc	61700	ug/kg	D	2030	10200	25	10	MS	SKJ	07/25/16 21:30	160725−6	1582595

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1582558	1582557	SW846 3050B	0.508	g	50	mL	07/18/16	JP1
1582595	1582593	SW846 3050B	0.504	g	50	mL	07/18/16	JP1

***Analytical Methods:**

P **SW846 3050B/6010C**
MS **SW846 3050B/6020A**

GEL Laboratories LLC

METALS
−1−
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL401766 **CONTRACT:** CPRC0F16043 **METHOD TYPE:** SW846

SAMPLE ID: 401766004 **BASIS:** Dry Weight **DATE COLLECTED** 14−JUL−16

CLIENT ID: B36645 **LEVEL:** Low **DATE RECEIVED** 16−JUL−16

MATRIX: SOIL **%SOLIDS:** 97

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429−90−5	Aluminum	9460000	ug/kg	D*	14800	49300	50	10	MS	SKJ	07/25/16 21:45	160725−6	1582595
7440−36−0	Antimony	6390	ug/kg	UD	6390	19400	19400	20	P	HSC	07/28/16 08:54	072816A−2	1582558
7440−38−2	Arsenic	735	ug/kg	BD	197	985	10	2	MS	SKJ	07/22/16 19:40	160722−5	1582595
7440−39−3	Barium	77900	ug/kg	D	493	1970	20	10	MS	SKJ	07/25/16 21:45	160725−6	1582595
7440−43−9	Cadmium	344	ug/kg	D	19.7	197	5	2	MS	SKJ	07/22/16 19:40	160722−5	1582595
7440−70−2	Calcium	7140000	ug/kg	*	7750	24200	24200	1	P	HSC	07/29/16 09:16	072916−3	1582558
7440−47−3	Chromium	8180	ug/kg	D*N	197	591	10	2	MS	SKJ	07/22/16 19:40	160722−5	1582595
7440−48−4	Cobalt	11100	ug/kg	D	59.1	197	20	2	MS	SKJ	07/22/16 19:40	160722−5	1582595
7440−50−8	Copper	35300	ug/kg	D	325	985	8	10	MS	SKJ	07/25/16 21:45	160725−6	1582595
7439−89−6	Iron	31100000	ug/kg	*	7750	24200	24200	1	P	HSC	07/29/16 09:16	072916−3	1582558
7439−92−1	Lead	2230	ug/kg	D*	98.5	394	15	2	MS	SKJ	07/22/16 19:40	160722−5	1582595
7439−95−4	Magnesium	4470000	ug/kg		8230	29100	29100	1	P	HSC	07/29/16 09:16	072916−3	1582558
7439−96−5	Manganese	315000	ug/kg	D	985	4930	5	10	MS	SKJ	07/26/16 11:58	160726−7	1582595
7439−98−7	Molybdenum	2050	ug/kg	D*	59.1	197	20	2	MS	SKJ	07/22/16 19:40	160722−5	1582595
7440−02−0	Nickel	10600	ug/kg	D	98.5	394	40	2	MS	SKJ	07/22/16 19:40	160722−5	1582595
7723−14−0	Phosphorous	1670000	ug/kg	D	48400	145000	145000	10	P	HSC	07/29/16 08:54	072916−3	1582558
7440−09−7	Potassium	1120000	ug/kg		6200	24200	24200	1	P	HSC	07/29/16 09:16	072916−3	1582558
7782−49−2	Selenium	325	ug/kg	UDN	325	985	50	2	MS	SKJ	07/25/16 22:21	160725−6	1582595
7440−22−4	Silver	480	ug/kg	B	96.9	484	484	1	P	HSC	07/29/16 10:45	072916−1	1582558
7440−23−5	Sodium	3850000	ug/kg		6780	24200	24200	1	P	HSC	07/29/16 09:16	072916−3	1582558
7440−24−6	Strontium	37300	ug/kg	D	1970	9850	10	10	MS	SKJ	07/25/16 21:45	160725−6	1582595
7440−62−2	Vanadium	51200	ug/kg	D*	296	985	985	2	MS	BAJ	07/27/16 23:11	160727−4	1582595
7440−66−6	Zinc	51400	ug/kg	D	1970	9850	25	10	MS	SKJ	07/25/16 21:45	160725−6	1582595

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1582558	1582557	SW846 3050B	0.532	g	50	mL	07/18/16	JP1
1582595	1582593	SW846 3050B	0.523	g	50	mL	07/18/16	JP1

***Analytical Methods:**

P **SW846 3050B/6010C**
MS **SW846 3050B/6020A**

Quality Control Summary

GEL LABORATORIES LLC
2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

QC Summary

Report Date: July 29, 2016

CH2MHill Plateau Remediation Company
MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 401766

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date Time
Metals Analysis - ICPMS										
Batch 1582595										
QC1203587004 401766002 DUP										
Aluminum	*D	8350000	*D	6420000	ug/kg	26.1*		(0%-20%)	SKJ	07/25/16 21:34
Arsenic	BD	605	BD	423	ug/kg	35.5 ^		(+/-945)		07/22/16 19:25
Barium	D	77700	D	72600	ug/kg	6.84		(0%-20%)		07/25/16 21:34
Cadmium	D	396	D	324	ug/kg	20 ^		(+/-189)		07/22/16 19:25
Chromium	*DN	15100	*D	3570	ug/kg	124*		(0%-20%)		
Cobalt	D	11500	D	11300	ug/kg	1.4		(0%-20%)		
Copper	D	26500	D	23400	ug/kg	12.7		(0%-20%)		07/25/16 21:34
Lead	*D	1930	*D	1350	ug/kg	35.5*^		(+/-378)		07/22/16 19:25
Manganese	D	352000	D	345000	ug/kg	2.02		(0%-20%)		07/26/16 11:52
Molybdenum	*D	3440	*D	781	ug/kg	126*^		(+/-189)		07/22/16 19:25
Nickel	D	8500	D	7030	ug/kg	18.9		(0%-20%)		
Selenium	DNU	336	DU	312	ug/kg	N/A				07/25/16 22:05
Strontium	D	32700	D	29100	ug/kg	11.6 ^		(+/-9450)		07/25/16 21:34
Vanadium	*D	62100	*D	45300	ug/kg	31.3*		(0%-20%)	BAJ	07/27/16 23:06
Zinc	D	61700	D	52200	ug/kg	16.6		(0%-20%)	SKJ	07/25/16 21:34
QC1203587003 LCS										
Aluminum	198000		D	203000	ug/kg		103	(80%-120%)		07/25/16 21:18
Arsenic	4940		D	4690	ug/kg		94.9	(80%-120%)		07/22/16 19:09
Barium	4940		D	5090	ug/kg		103	(80%-120%)		07/25/16 21:18
Cadmium	4940		D	4740	ug/kg		95.8	(80%-120%)		07/22/16 19:09

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QC Summary

Workorder: **401766**

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date Time
Metals Analysis - ICPMS										
Batch 1582595										
Chromium	4940		D	5250	ug/kg		106	(80%-120%)		
Cobalt	4940		D	4970	ug/kg		101	(80%-120%)	SKJ	07/22/16 19:09
Copper	4940		D	5280	ug/kg		107	(80%-120%)		07/25/16 21:18
Lead	4940		D	5110	ug/kg		103	(80%-120%)		07/22/16 19:09
Manganese	4940		D	5230	ug/kg		106	(80%-120%)		07/26/16 11:48
Molybdenum	4940		D	4900	ug/kg		99.2	(80%-120%)		07/22/16 19:09
Nickel	4940		D	5050	ug/kg		102	(80%-120%)		
Selenium	4940		D	4150	ug/kg		84.1	(80%-120%)		07/25/16 21:18
Strontium	4940		D	4810	ug/kg		97.3	(80%-120%)		
Vanadium	4940		D	4930	ug/kg		99.7	(80%-120%)	BAJ	07/27/16 23:03
Zinc	4940		D	5720	ug/kg		116	(80%-120%)	SKJ	07/25/16 21:18
QC1203587002 MB										
Aluminum			DU	2900	ug/kg					07/25/16 21:14
Arsenic			DU	193	ug/kg					07/22/16 19:05
Barium			DU	96.7	ug/kg					07/25/16 21:14
Cadmium			DU	19.3	ug/kg					07/22/16 19:05
Chromium			DU	193	ug/kg					
Cobalt			DU	58.0	ug/kg					
Copper			DU	63.8	ug/kg					07/25/16 21:14
Lead			DU	96.7	ug/kg					07/22/16 19:05
Manganese			DU	193	ug/kg					07/26/16 11:46
Molybdenum			DU	58.0	ug/kg					07/22/16 19:05
Nickel			DU	96.7	ug/kg					

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QC Summary

Workorder: 401766

Parmname	NOM		Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date Time
Metals Analysis - ICPMS											
Batch 1582595											
Selenium				DU	319	ug/kg				SKJ	07/25/16 21:14
Strontium				DU	387	ug/kg					
Vanadium				DU	290	ug/kg				BAJ	07/27/16 23:02
Zinc				BD	855	ug/kg				SKJ	07/25/16 21:14
QC1203587005 401766002 MS											
Aluminum	196000	*D	8350000	D	8620000	ug/kg		N/A	(75%-125%)		07/25/16 21:38
Arsenic	4910	BD	605	D	5010	ug/kg		89.7	(75%-125%)		07/22/16 19:28
Barium	4910	D	77700	D	79900	ug/kg		N/A	(75%-125%)		07/25/16 21:38
Cadmium	4910	D	396	D	4960	ug/kg		93	(75%-125%)		07/22/16 19:28
Chromium	4910	*DN	15100	DN	16500	ug/kg		29.3*	(75%-125%)		
Cobalt	4910	D	11500	D	17200	ug/kg		116	(75%-125%)		
Copper	4910	D	26500	D	32200	ug/kg		N/A	(75%-125%)		07/25/16 21:38
Lead	4910	*D	1930	D	6440	ug/kg		91.9	(75%-125%)		07/22/16 19:28
Manganese	4910	D	352000	D	401000	ug/kg		N/A	(75%-125%)		07/26/16 11:54
Molybdenum	4910	*D	3440	D	7720	ug/kg		87.1	(75%-125%)		07/22/16 19:28
Nickel	4910	D	8500	D	13800	ug/kg		108	(75%-125%)		
Selenium	4910	DNU	336	DN	3640	ug/kg		74.2*	(75%-125%)		07/25/16 22:09
Strontium	4910	D	32700	D	39900	ug/kg		N/A	(75%-125%)		07/25/16 21:38
Vanadium	4910	*D	62100	D	71400	ug/kg		N/A	(75%-125%)	BAJ	07/27/16 23:07
Zinc	4910	D	61700	D	68400	ug/kg		N/A	(75%-125%)	SKJ	07/25/16 21:38
QC1203591115 401766002 PS											
Chromium	25.0	*DN	74.2	D	99.2	ug/L		99.9	(80%-120%)		07/22/16 19:32
Selenium	25.0	DNU	-3.21	D	19.4	ug/L		77.7*	(80%-120%)		07/25/16 22:13

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QC Summary

Workorder: 401766

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date Time
Metals Analysis - ICPMS										
Batch 1582595										
QC1203587006 401766002 SDILT										
Aluminum	*D	8210	D	1750	ug/L	6.34		(0%-10%)	SKJ	07/25/16 21:42
Arsenic	BD	2.98	DU	1020	ug/L	N/A		(0%-10%)		07/22/16 19:36
Barium	D	76.5	D	16.2	ug/L	5.79		(0%-10%)		07/25/16 21:42
Cadmium	D	1.95	BD	0.360	ug/L	7.5		(0%-10%)		07/22/16 19:36
Chromium	*DN	74.2	D	14.7	ug/L	1.12		(0%-10%)		
Cobalt	D	56.4	D	11.7	ug/L	3.64		(0%-10%)		
Copper	D	26.1	D	5.53	ug/L	5.93		(0%-10%)		07/25/16 21:42
Lead	*D	9.48	D	2.01	ug/L	5.98		(0%-10%)		07/22/16 19:36
Manganese	D	346	D	74.1	ug/L	7.14		(0%-10%)		07/26/16 11:56
Molybdenum	*D	16.9	D	3.39	ug/L	.165		(0%-10%)		07/22/16 19:36
Nickel	D	41.8	D	8.87	ug/L	6.02		(0%-10%)		
Selenium	DNU	-3.21	DU	1680	ug/L	N/A		(0%-10%)		07/25/16 22:17
Strontium	D	32.2	BD	6.68	ug/L	3.73		(0%-10%)		07/25/16 21:42
Vanadium	*D	305	D	58.5	ug/L	4.28		(0%-10%)	BAJ	07/27/16 23:10
Zinc	D	60.7	D	14.5	ug/L	19.2		(0%-10%)	SKJ	07/25/16 21:42
Metals Analysis-ICP										
Batch 1582558										
QC1203586938 401766002 DUP										
Antimony	DU	6660	DU	6720	ug/kg	N/A			HSC	07/28/16 09:00
Calcium	*	8100000	*	6340000	ug/kg	24.4*		(0%-20%)		07/29/16 08:47
Iron	*D	108000000	*D	33800000	ug/kg	105*		(0%-20%)		07/29/16 09:21
Magnesium		5030000		4790000	ug/kg	4.89		(0%-20%)		07/29/16 08:47

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QC Summary

Workorder: 401766

Parmname	NOM		Sample	Qual	QC	Units	RPD/D%		REC%	Range	Anlst	Date Time
Metals Analysis-ICP												
Batch 1582558												
Phosphorous		D	1580000	D	1630000	ug/kg	3.48			(0%-20%)		07/29/16 09:21
Potassium		D	926000	D	1000000	ug/kg	7.89	^		(+/-255000)	HSC	
Silver		BD	3000	DU	2040	ug/kg	109	^		(+/-10200)		07/28/16 09:00
Sodium			3820000		3560000	ug/kg	7			(0%-20%)		07/29/16 08:47
QC1203586937 LCS												
Antimony	50000				48600	ug/kg			97.2	(80%-120%)		07/28/16 08:51
Calcium	500000				509000	ug/kg			102	(80%-120%)		07/29/16 08:40
Iron	500000				496000	ug/kg			99.2	(80%-120%)		
Magnesium	500000				508000	ug/kg			102	(80%-120%)		
Phosphorous	50000				48400	ug/kg			96.8	(80%-120%)		
Potassium	500000				489000	ug/kg			97.8	(80%-120%)		
Silver	50000				48000	ug/kg			96	(80%-120%)		07/28/16 08:51
Sodium	500000				498000	ug/kg			99.6	(80%-120%)		07/29/16 08:40
QC1203586936 MB												
Antimony				U	309	ug/kg						07/28/16 08:48
Calcium				U	7490	ug/kg						07/29/16 08:37
Iron				U	7490	ug/kg						
Magnesium				U	7960	ug/kg						
Phosphorous				U	4680	ug/kg						
Potassium				U	5990	ug/kg						
Silver				U	93.6	ug/kg						07/28/16 08:48
Sodium				U	6550	ug/kg						07/29/16 08:37
QC1203586939 401766002 MS												
Antimony	50600	DU	6660	D	50200	ug/kg			99.2	(75%-125%)		07/28/16 09:04

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QC Summary

Workorder: 401766

Parmname	NOM		Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date Time
Metals Analysis-ICP											
Batch 1582558											
Calcium	506000	*	8100000		7880000	ug/kg		N/A	(75%-125%)		07/29/16 08:49
Iron	506000	*D	108000000	D	28700000	ug/kg		N/A	(75%-125%)	HSC	07/29/16 09:24
Magnesium	506000		5030000		4890000	ug/kg		N/A	(75%-125%)		07/29/16 08:49
Phosphorous	50600	D	1580000	D	1380000	ug/kg		N/A	(75%-125%)		07/29/16 09:24
Potassium	506000	D	926000	D	1390000	ug/kg		92.6	(75%-125%)		
Silver	50600	BD	3000	D	51300	ug/kg		95.3	(75%-125%)		07/28/16 09:04
Sodium	506000		3820000		4090000	ug/kg		N/A	(75%-125%)		07/29/16 08:49
QC1203586940 401766002 SDILT											
Antimony		DU	-1.52	DU	33300	ug/L	N/A		(0%-10%)		07/28/16 09:10
Calcium		*	80300	D	15900	ug/L	.787		(0%-10%)		07/29/16 08:51
Iron		*D	107000	D	21600	ug/L	.672		(0%-10%)		07/29/16 09:30
Magnesium			49800	D	10400	ug/L	3.93		(0%-10%)		07/29/16 08:51
Phosphorous		D	1560	D	324	ug/L	3.44		(0%-10%)		07/29/16 09:30
Potassium		D	918	BD	213	ug/L	16.2		(0%-10%)		
Silver		BD	1.49	DU	10100	ug/L	N/A		(0%-10%)		07/28/16 09:10
Sodium			37900	D	7590	ug/L	.156		(0%-10%)		07/29/16 08:51

Notes:

The Qualifiers in this report are defined as follows:

- * Duplicate analysis not within control limits
- + Correlation coefficient for Method of Standard Additions (MSA) is < 0.995
- B The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).
- C Target analyte was detected in the sample and the associated blank. The associated blank concentration is >= EQL or is > 5% of the measured concentration and/or decision level for associated samples.
- D Results are reported from a diluted aliquot of sample.
- E Reported value is estimated due to interferences. See comment in narrative.
- M Duplicate precision not met.

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QC Summary

Workorder: **401766**

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time

N Spike Sample recovery is outside control limits.

S Reported value determined by the Method of Standard Additions (MSA)

U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.

W Post-digestion spike recovery for GFAA out of control limit. Sample absorbency < 50% of spike absorbency.

X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier

Y Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier

Z Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.
^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.
* Indicates that a Quality Control parameter was not within specifications.
For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.

General Chem Analysis

Case Narrative

General Chemistry
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL401766
Work Order #: 401766

Product: **Carbon, Total Organic**
Analytical Method: SW846 9060A Modified
Analytical Procedure: GL-GC-E-093 REV# 14
Analytical Batch: 1582512

Preparation Method: SW846 9060A Modified Prep
Preparation Procedure: GL-GC-E-093 REV# 14
Preparation Batch: 1582508

The following samples were analyzed using the above methods and analytical procedure(s).

GEL Sample ID#	Client Sample Identification
401766002	B36649
401766004	B36645
1203586801	Method Blank (MB)
1203586802	Laboratory Control Sample (LCS)
1203586803	401766002(B36649) Sample Duplicate (DUP)
1203586805	401766002(B36649) Post Spike (PS)

The samples in this SDG were analyzed on an "as received" basis.

Data Summary:

There are no exceptions, anomalies or deviations from the specified methods. All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable.

Product: pH
Analytical Method: SW846 9045D
Analytical Procedure: GL-GC-E-008 REV# 21
Analytical Batch: 1582389

The following samples were analyzed using the above methods and analytical procedure(s).

GEL Sample ID#	Client Sample Identification
401766002	B36649
401766004	B36645
1203586455	Laboratory Control Sample (LCS)
1203586456	401766002(B36649) Sample Duplicate (DUP)

The samples in this SDG were analyzed on an "as received" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Technical Information

Holding Times
Samples (See Below) were received by the laboratory outside of the method specified holding time. The data is qualified.

Sample	Analyte	Value
1203586456 (B36649DUP)	pH	Received 16-JUL-16, out of holding 14-JUL-16
401766002 (B36649)	pH	Received 16-JUL-16, out of holding 14-JUL-16
401766004 (B36645)	pH	Received 16-JUL-16, out of holding 14-JUL-16

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Qualifier Definition Report
for

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL401766 GEL Work Order: 401766

The Qualifiers in this report are defined as follows:

B The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).

U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.

X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier

Review/Validation

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

Signature: Kristen Mizzell **Name: Kristen Mizzell**

Date: 29 JUL 2016 **Title: Analyst I**

Sample Data Summary

GEL LABORATORIES LLC
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: July 29, 2016

Company : CH2MHill Plateau Remediation Company
Address : MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington 99352
Contact: Mr. Scot Fitzgerald
Project: CHPRC SAF F16-043

Client Sample ID: B36649
Sample ID: 401766002
Matrix: SOIL
Collect Date: 14-JUL-16 14:15
Receive Date: 16-JUL-16
Collector: Client
Moisture: 2.42%

Project: CPRC0F16043
Client ID: CPRC001

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Carbon Analysis												
9060_TOC: COMMON "As Received"												
Total Organic Carbon #1	B	260000	200000	500000	ug/Kg	1.00	1	TSM	07/25/16	1154	1582512	1
Total Organic Carbon #2	B	220000	200000	500000	ug/Kg	1.00	1					
Total Organic Carbon #3	B	210000	200000	500000	ug/Kg	1.00	1					
Total Organic Carbon #4	B	210000	200000	500000	ug/Kg	1.00	1					
Total Organic Carbon Average	B	210000	200000	500000	ug/Kg	1.00	1					
Titration and Ion Analysis												
9045_pH (Non-Aqueous):COMMON "As Received"												
pH at Temp 24.1C	X	11.1	0.010	0.100	SU		1	RXB5	07/16/16	1619	1582389	2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 9060A Modified Prep	SW846 9060A Modified Total Organic Carbon	TSM	07/18/16	1730	1582508

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 9060A Modified	
2	SW846 9045D	

Notes:

Column headers are defined as follows:

DF: Dilution Factor
DL: Detection Limit
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration
Lc/LC: Critical Level
PF: Prep Factor
RL: Reporting Limit
SQL: Sample Quantitation Limit

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Certificate of Analysis

Report Date: July 29, 2016

Company : CH2MHill Plateau Remediation Company
Address : MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington 99352
Contact: Mr. Scot Fitzgerald
Project: CHPRC SAF F16-043

Client Sample ID: B36645
Sample ID: 401766004
Matrix: SOIL
Collect Date: 14-JUL-16 14:15
Receive Date: 16-JUL-16
Collector: Client
Moisture: 2.98%

Project: CPRC0F16043
Client ID: CPRC001

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Carbon Analysis												
9060_TOC: COMMON "As Received"												
Total Organic Carbon #1	B	280000	200000	500000	ug/Kg	1.00	1	TSM	07/25/16	1312	1582512	1
Total Organic Carbon #2	B	230000	200000	500000	ug/Kg	1.00	1					
Total Organic Carbon #3	B	220000	200000	500000	ug/Kg	1.00	1					
Total Organic Carbon #4	B	210000	200000	500000	ug/Kg	1.00	1					
Total Organic Carbon Average	B	220000	200000	500000	ug/Kg	1.00	1					
Titration and Ion Analysis												
9045_pH (Non-Aqueous):COMMON "As Received"												
pH at Temp 24.1C	X	11.0	0.010	0.100	SU		1	RXB5	07/16/16	1623	1582389	2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 9060A Modified Prep	SW846 9060A Modified Total Organic Carbon	TSM	07/18/16	1730	1582508

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 9060A Modified	
2	SW846 9045D	

Notes:

Column headers are defined as follows:

DF: Dilution Factor
DL: Detection Limit
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration
Lc/LC: Critical Level
PF: Prep Factor
RL: Reporting Limit
SQL: Sample Quantitation Limit

Quality Control Summary

GEL LABORATORIES LLC
2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

QC Summary

Report Date: July 29, 2016

CH2MHill Plateau Remediation Company
MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington

Contact: **Mr. Scot Fitzgerald**

Workorder: **401766**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Carbon Analysis											
Batch 1582512											
QC1203586803 401766002 DUP											
Total Organic Carbon Average	B	210000	U	200000	ug/Kg	33.3 ^		(+/-500000)	TSM	07/25/16	12:20
QC1203586802 LCS											
Total Organic Carbon Average	3470000			2890000	ug/Kg		83.3	(80%-120%)		07/25/16	11:35
QC1203586801 MB											
Total Organic Carbon Average			U	200000	ug/Kg					07/25/16	11:18
QC1203586805 401766002 PS											
Total Organic Carbon Average	5000	B	210	5190	mg/kg		99.6	(75%-125%)		07/25/16	12:46
Titration and Ion Analysis											
Batch 1582389											
QC1203586456 401766002 DUP											
pH	X	11.1	X	11.1	SU	0.0901		(0%-30%)	RXB5	07/16/16	16:21
QC1203586455 LCS											
pH	7.00			6.96	SU		99.4	(70%-130%)		07/16/16	16:17

Notes:

The Qualifiers in this report are defined as follows:

- < Sample is below the EPA guidance level for Reactive Releasable Cyanide and/or Reactive Releasable Sulfide
- > Result greater than quantifiable range or greater than upper limit of the analysis range
- B The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).
- C Target analyte was detected in the sample and the associated blank. The associated blank concentration is >= EQL or is > 5% of the measured concentration and/or decision level for associated samples.
- D Results are reported from a diluted aliquot of sample.
- N Spike Sample recovery is outside control limits.
- U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Y Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Z Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier

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QC Summary

Workorder: **401766**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.
^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.
* Indicates that a Quality Control parameter was not within specifications.
For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.

Radiological Analysis

Case Narrative

Radiochemistry
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL401766
Work Order #: 401766

Product: **Dry Weight**
Analytical Method: ASTM D 2216 (Modified)
Analytical Procedure: GL-OA-E-020 REV# 10
Analytical Batch: 1582403

The following samples were analyzed using the above methods and analytical procedure(s).

GEL Sample ID#	Client Sample Identification
401766001	B36644
401766002	B36649
401766003	B36648
401766004	B36645
1203586469	401772001(NonSDG) Sample Duplicate (DUP)

The samples in this SDG were analyzed on an "as received" basis.

Data Summary:

There are no exceptions, anomalies or deviations from the specified methods. All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable.

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

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Qualifier Definition Report
for

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL401766 GEL Work Order: 401766

The Qualifiers in this report are defined as follows:

Review/Validation

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

Signature:  **Name: Theresa Austin**

Date: 22 JUL 2016 **Title: Group Leader**

Sample Data Summary

Rad
Certificate of Analysis
Sample Summary

SDG Number:	**GEL401766**	**Client:**	**CPRC001**	**Project:**	**CPRC0F16043**
Lab Sample ID:	**401766002**	**Date Collected:**	**07/14/2016 14:15**	**Matrix:**	**SOIL**
		Date Received:	**07/16/2016 09:10**	**%Moisture:**	**2.4**
Client ID:	**B36649**			**Prep Basis:**	**"As Received"**
Batch ID:	**1582403**	**Method:**	**ASTM D 2216 (Modified)**	**SOP Ref:**	**GL-OA-E-020**
Run Date:	**07/18/2016 05:26**	**Analyst:**	**LYT1**	**Instrument:**	**SP-39020004**
Data File:				**Count Time:**	
Prep Batch:	**1582403**				
Prep Date:	**07/18/2016 05:26**				

CAS No.	Parmname	Qual	Result	Units	MDC	
%MOISTURE	Moisture		2.42	percent	+/-	

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits

Comments:

TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

The MDC is a sample specific MDC.

Rad
Certificate of Analysis
Sample Summary

SDG Number:	**GEL401766**	**Client:**	**CPRC001**	**Project:**	**CPRC0F16043**
Lab Sample ID:	**401766004**	**Date Collected:**	**07/14/2016 14:15**	**Matrix:**	**SOIL**
		Date Received:	**07/16/2016 09:10**	**%Moisture:**	**3**
Client ID:	**B36645**			**Prep Basis:**	**"As Received"**
Batch ID:	**1582403**	**Method:**	**ASTM D 2216 (Modified)**	**SOP Ref:**	**GL-OA-E-020**
Run Date:	**07/18/2016 05:26**	**Analyst:**	**LYT1**	**Instrument:**	**SP-39020004**
Data File:				**Count Time:**	
Prep Batch:	**1582403**				
Prep Date:	**07/18/2016 05:26**				

CAS No.	Parmname	Qual	Result	Units	MDC	
%MOISTURE	Moisture		2.98	percent	+/-	

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits

Comments:

TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

The MDC is a sample specific MDC.

Quality Control Summary

GEL LABORATORIES LLC
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QC Summary

Client : CH2MHill Plateau Remediation Company
MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington 99352

Contact: Mr. Scot Fitzgerald

Workorder: 401766

Report Date: July 22, 2016

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date	Time
Gravimetric Solids										
Batch 1582403										
QC1203586469 401772001 DUP										
Moisture		1.23		1.40	percent			LYT1	07/18/16	05:26
						RPD: 16	(0%-20%)			

Notes:

TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

The Qualifiers in this report are defined as follows:

*	Duplicate analysis not within control limits
+	Correlation coefficient for Method of Standard Additions (MSA) is < 0.995
<	Sample is below the EPA guidance level for Reactive Releasable Cyanide and/or Reactive Releasable Sulfide
>	Result greater than quantifiable range or greater than upper limit of the analysis range
B	The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).
B	The associated QC sample blank has a result >= 2X the MDA and, after corrections, result is >= MDA for this sample
C	Target analyte was detected in the sample and the associated blank. The associated blank concentration is >= EQL or is > 5% of the measured concentration and/or decision level for associated samples.
D	Results are reported from a diluted aliquot of sample.
E	Reported value is estimated due to interferences. See comment in narrative.
M	Duplicate precision not met.
N	Spike Sample recovery is outside control limits.
S	Reported value determined by the Method of Standard Additions (MSA)
U	Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
UX	Gamma Spectroscopy--Uncertain identification
W	Post-digestion spike recovery for GFAA out of control limit. Sample absorbency < 50% of spike absorbency.
X	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
Y	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
Z	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.
** Indicates analyte is a surrogate compound.
^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptence criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.
For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.